Topic: TEXTILE AND CLOTHING

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FUNDAMENTALS OF TEXTILES AND CLOTHING

Clothing is one of the basic needs for mankind. It protects the body from heat and cold, but also brings out one's personality, enhances beauty, gives comfort and expresses the status of living. Thus, the need to study about fiber, fabric and clothing in this chapter. Fundamentals of Textiles and clothing. **FIBERS Fibers** are very small visible units from which fabrics are made by one process or another. Take a yarn or thread and untwist until it comes apart, or pull a single strand from an opened cotton ball or from a bunch of wool. The small fine, individual hair-like strands are fibers. Thus, a fiber may be partly described as being a slender filament or fine strand of sufficient length, pliability and strength, to be spun into yarns and formed into cloth.

6.1.1 Fiber properties:

The fibers possess certain essential properties. These are the **primary** and **secondary** properties.

The primary properties include :

a) High length to breadth (width) ratio

b) Tenacity or Fiber strength

c) Flexibility or Pliability.

d) Cohesiveness or spinning quality of fibers, and

e) Uniformity Secondary properties of fibers are not essential but desirable for consumer satisfaction. These include:

a) Physical shape

b) Specific gravity

c) Luster

d) Moisture regains

e) Elastic recovery

f) Elongation

g) Resilience

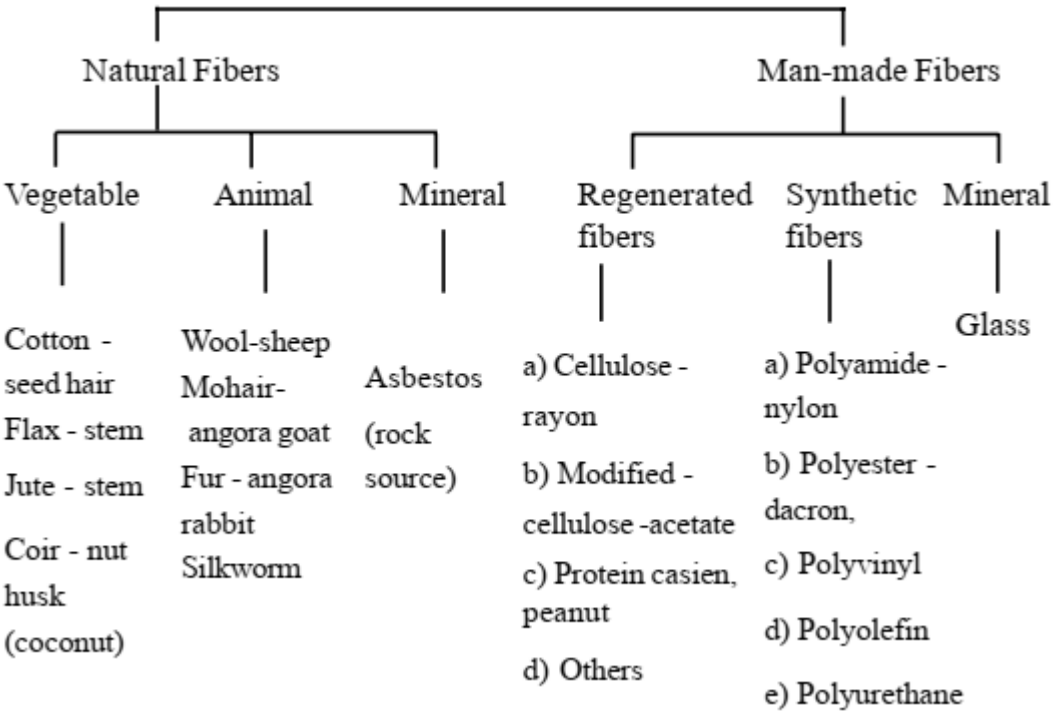
h) Thermal behavior

i) Resistance to biological organisms

j) Resistance to chemical and other environmental conditions.

Broad classification of fibers

Table-1



The cotton fiber is a long cell made up of countless cellulose molecules. Cotton is removed mechanically from the seed balls by the cotton gin. The ginned cotton is then pressed into bales and sent to the factories to be spun into yarns.

Manufacture: The main processes are bale breaking and cleaning, carding, combing, spinning, weaving, scouring, bleaching and dyeing.

Bale breaking and cleaning

The tightly pressed cotton fibers from the bales are loosened in a machine, the impurities falling out. Another machine removes more impurities until sheets of loose fiber like cotton wool emerge ready for carding.

Carding: The shorter fibers are further removed in this process and the fibers are made to lie flat called **slivers.**

Combing: removes more short hairs and makes fibers more parallel.

Spinning: The combed sliver is now converted into yarn by spinning. Scouring and Bleaching is usually done after weaving to enable the cloth to be dyed easily.

Properties of cotton: Cotton fiber is a single cell and varies in length from ½ to 2½ inches. The width varies between 12 to 20 microns.

Microscopic Appearance: Cotton appears as a flat tube with spiral twists in longitudinal view, under cross section it is bean shaped with lumen.

NATURAL FIBERS

These include cotton, silk and wool.

Cotton

Cotton referred to as the **"King of fibers"** is most important textile fibre in the world. Cotton fabrics were made by the ancient Egyptian, Chinese and of course Indian civilizations. Natural Fibers Man-made Fibers Vegetable Animal Mineral Regenerated Synthetic Mineral fibers. The cotton fiber is a long cell made up of countless cellulose molecules. Cotton is removed mechanically from the seed balls by the cotton gin. The ginned cotton is then pressed into bales and sent to the factories to be spun into yarns.

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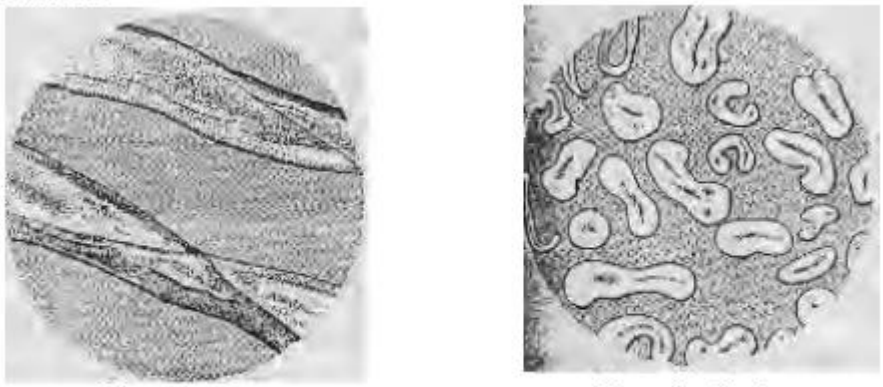

Cross Section Longitudinal

Fig. 1 - Microscopic Appearance of Cotton

Physical properties:

1. The cotton fibers vary in colour (i.e) white to cream.

2. Cotton has low luster, elasticity & resilience.

3. It is 25% stronger when wet than dry and absorbs moisture.

4. Cotton fabrics shrink and hence they are made shrink resistant.

Thermal properties:

1. Cotton burns quickly and readily with a smell of burning paper.

2. It is a good conductor of heat.

3. It will scorch when ironed with too-high temperatures.

Chemical Properties:

1. Cotton is resistant to alkali.

2. Strong acids disintegrate cotton.

3. It is resistant to organic solvents.

4. Mercerized cotton can be dyed easily.

Biological Properties:

1. Cotton is damaged by fungi such as mildew and bacteria.

2. Silverfish lives on cellulose, so it damages cotton fibers.

3. Moths and beetles do not attack or damage cotton.

Uses of cotton:

Cotton is the most widely used fiber because it is inexpensive, easy-care, high absorbency, excellent launder ability and good colour fastness. It is not only used for apparel but also for household and industrial applications.